

**LVPECL UHF CLOCK (XO)  
SD-A29JXXX Series (3.3 Volt)  
SD-B29JXXX Series (2.5 Volt)**

**Description**

The **SD-X29JXXX Series** of quartz crystal oscillators provides ultra high frequency with LVPECL complementary outputs. The outputs can be Tri-stated for test automation or combining multiple clocks. The device is based on advanced PLL multiplication for higher frequencies, and packaged in a miniature, low profile leadless ceramic SMD package with 6 gold plated pads.

**Applications and Features**

- Wide frequency range – 38.0MHz to 640.000MHz
- Fiber Channel; 10 GbE; Infiniband; Network Processors; SOHO Routing
- High Reliability - NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Low Phase Noise, Low Jitter
- High shock resistance, to 1000g
- Ultra High Frequency
- Tight frequency stability -  $\pm 20$  ppm overall available
- Grounded lid and internal by-pass capacitor reduce EMI
- RoHS Compliant, Lead Free Construction

| Creating a Part Number         |                 |                      |   |
|--------------------------------|-----------------|----------------------|---|
| <b>SD - X 29J X X X - FREQ</b> |                 |                      |   |
| <b>Package Code</b>            | _____           | <b>Input Voltage</b> | <b>Overall Frequency Stability, ppm</b> |
| SD                             | 6 pad 5x7mm SMD | A 3.3V $\pm$ 5%      | E $\pm$ 20                              |
|                                |                 | B 2.5V $\pm$ 5%      | F $\pm$ 25                              |
|                                |                 |                      | G $\pm$ 50                              |
|                                |                 |                      | H $\pm$ 100                             |
|                                |                 |                      | 9 Customer specific                     |
| <b>Enable Option</b>           | _____           |                      | <b>Temperature Range, °C</b>            |
| H                              | Enable High     |                      | A 0 to 50                               |
| L                              | Enable Low      |                      | B 0 to 70                               |
|                                |                 |                      | C -20 to 70                             |
|                                |                 |                      | D -40 to 85                             |
|                                |                 |                      | 9 Customer specific                     |

**SD-X29JXXX Series Continued  
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**Absolute Maximum Ratings**

| Parameter                   | Symbol  | Value       | Unit |
|-----------------------------|---------|-------------|------|
| Operating Temperature Range | To      | -40 to +85  | °C   |
| Storage Temperature Range   | Tst     | -50 to +90  | °C   |
| Supply Voltage              | Vcc     | -0.5 to 4.5 | V    |
| Enable/Disable Voltage      | Ven/dis | 0 to Vcc    | V    |

**Electrical Parameters**

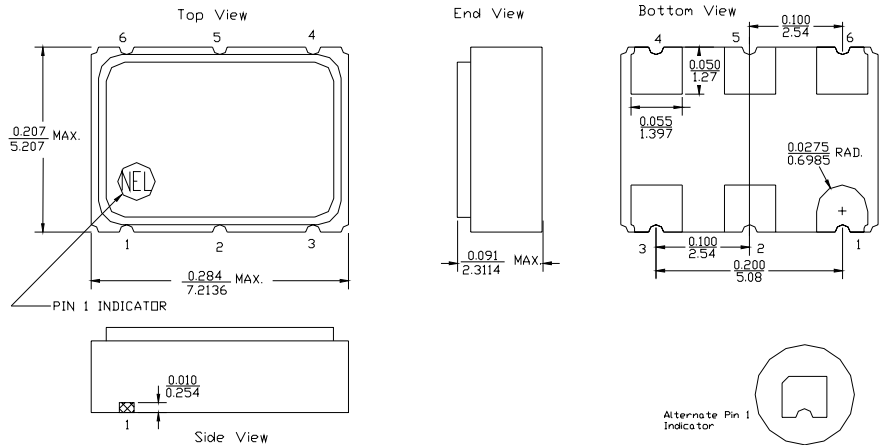
| Parameter   | Symb                       | Conditions, Note   | MIN  | TYP  | MAX            | Unit   |
|---|----------------------------|--|--|--|----------------|--------|
| Nominal Frequency                                     | Fo                         |  | 38   |  | 640            | MHz    |
| Supply Voltage  | Vcc                        | Code A<br>Code B   | 3.135<br>2.375   | 3.3<br>2.5   | 3.465<br>2.625 | V      |
| Supply current  | Icc                        |  |  | 80   | 100            | mA     |
| Output Logic Type                                     |                            |  |  | LVPECL   |                |        |
| Load  |                            | Output to Vcc-2V, or<br>Thevenin Equivalent  |  | 50   |                | Ohm    |
| Output Levels   | Voh<br>Vol                 | overall  | Vcc-<br>1.025<br>Vcc-<br>1.620   |  |                | V      |
| Duty Cycle (Symmetry)                                 |                            | At 50% of output<br>voltage swing  | 45/55  | 50/50  | 55/45          | %      |
| Rise/Fall Time  | Tr/Tf                      | 20 to 80, 80 to 20 %   |  | 0.5  | 0.7            | ns     |
| <b>Jitter</b>   | Integrated                 | J  | Integrated from Phase<br>Noise, 12 KHz to 20<br>MHz, RMS                           |  | 0.4            | ps     |
|   | Wavecrest<br>characterized | Random<br>period,  | 155 MHz<br>622 MHz   | 3.5<br>6   |                | ps     |
|   |                            | Accumul.,<br>pk-to-pk  | 155 MHz<br>622 MHz   | 20<br>40   |                | ps     |
| Phase Noise   | £(Δf)                      | 155 MHz  | @ 10 Hz<br>@100 Hz<br>@1 KHz<br>@10KHz<br>@100KHz<br>@1MHz<br>@>10M                | -60<br>-90<br>-120<br>-130<br>-128<br>-144<br>-150 |                | dBc/Hz |
| Frequency Stability                                   | ΔF/F                       | Overall, including<br>initial calibration,<br>temperature, aging 10<br>years, shock and<br>vibration | See "Creating a Part Number"<br>Not all combinations available,<br>consult factory |  |                | ppm    |
| Enable High Option<br>Pin 2 Enabled<br>Pin 2 Disabled |                            | CMOS logic 1 or N/C<br>CMOS logic 0  | 0.7 Vcc<br>0   |  | Vcc<br>0.3 Vcc | V      |
| Enable Low Option<br>Pin 2 Disabled<br>Pin 2 Enabled  |                            | CMOS logic 1 or N/C<br>CMOS logic 0  | 0.7 Vcc<br>0   |  | Vcc<br>0.3 Vcc | V      |



### SD-X29JXXX Series Continued LVPECL UHF CLOCK (XO)

#### Electrical Connection

| Pin | Connection       |
|-----|------------------|
| 1   | Enable/Disable   |
| 2   | N.C.             |
| 3   | $V_{EE}$ /Ground |
| 4   | Output           |
| 5   | /Output          |
| 6   | $V_{CC}$         |

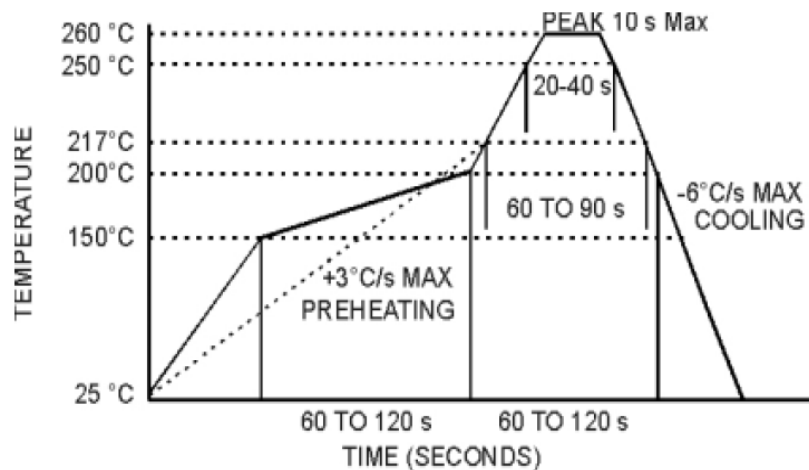


ALL DIMENSIONS:  $\frac{IN}{mm}$   
All tolerances are  $\pm 0.005$  inches ( $\pm 0.127$  mm) unless otherwise specified.

## Environmental and Mechanical Characteristics

|                              |   |
|------------------------------|---|
| <b>Operating temp. range</b> | see part # table  |
| <b>Mechanical Shock</b>      | Per MIL-STD-202, Method 213, Cond. E                      |
| <b>Thermal Shock</b>         | Per MIL-STD-883, Method 1011, Cond. A                     |
| <b>Vibration</b>             | Per MIL-STD-883, Method 2007, Cond. A                     |
| <b>Hermetic Seal</b>         | Leak rate less than $1 \times 10^{-8}$ atm.cc/s of helium |
| <b>Soldering conditions</b>  | See MAX reflow profile below                              |

#### Maximum Reflow Profile



**FREQUENCY  
CONTROLS, INC.**